Note to readers: References cited in this supplementary material are numbered according to the reference list of the main article.

Supplement 1. Additional materials for qualitative meta-analysis.
Part 1: Search strategy

MEDLINE search strategy (via OVID) Dec 29 2020
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R) <1946 to December 28, 2020>

1 exp Antibacterial agents/ 736927
2 exp Anti-Infective Agents/ 1648883
3 exp beta-Lactams/ 129618
4 exp Penicillins/ 81105
5 (beta-lactam* or antibacterial* or anti-infective* or penicillin* or amoxicillin* or antibiotic* or antimicrobial*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 681193
6 1 or 2 or 3 or 4 or 5 1911459
7 exp Hypersensitivity/ 348082
8 exp Drug Hypersensitivity/ 46434
9 exp Drug Hypersensitivity Syndrome/ 639
10 (Hypersensitivity or allerg* or adverse effect or adverse drug reaction or anaphylaxis or drug provocation test or skin prick testing).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 364898
11 7 or 8 or 9 or 10 510718
12 (De-label* or delabel*or label* or electronic health records or inappropriate registration or document* or stewardship or antimicrobial stewardship or antibiotic stewardship or incorrect* or spurious*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 502694
13 exp Antimicrobial stewardship/ 1744
14 exp Electronic health record/ 21440
15 exp Documentation/ 938569
16 exp Change management/ 114
17 12 or 13 or 14 or 15 or 16 1413012
18 (interview* or question* or attitude*or focus group* or qualitative* or qualitative research* or barrier* or enabler* or facilitator* or survey* or questionnaire* or observation*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 3206939
19 exp Attitude of Health Personnel/ 160388

20	exp Health Knowledge, Attitudes, Practice/	114268
21	exp Surveys/ and Questionnaires/	478699
22	exp Qualitative research/	59304
23	18 or 19 or 20 or 21 or 22	3318086
24	6 and 11 and 17 and 23	298

Part 2. Coding guide

Coding guide (adapted from Heslehurst et al.)[24]
Coding instructions:
1. The framework used for data analysis is the 14-Domain TDF version 2 (Atkins et al.).[17]
2. Code all relevant text into each domain.
3. Code all responses (as barriers or enablers using verbatim quotes if possible).
4. Only code to one domain.
5. Please use the "Decision Rule" columns to supplement the description of the domains and constructs for this context.

Domain	Construct	Decision Rule	Example
1.Knowledge	**Knowledge** (including knowledge of condition/ scientific rationale): An awareness of the existence of something. **Procedural knowledge:** Knowing how to do something. **Knowledge of task environment:** Knowledge of the social and material context in which a task is undertaken.	Consider coding to this domain if discussing knowledge of what an allergy is, professional development, guidelines, or a toolkit. Procedural knowledge- the knowledge of how to do something vs skills requires practice, competence, validate skills based on skills assessment.	"They stated that a clear definition of an antibiotic allergy and a clear overview of the different types of reactions is required." "family physicians and pharmacists admitted that they had insufficient knowledge about antibiotic allergies." "A need for patient education about the risks of avoiding penicillin in favour of second line antibiotics was identified."
2. Skills	**Skills:** An ability or proficiency acquired through training and/or practice. **Skills development:** The gradual acquisition or advancement through progressive stages of an ability or proficiency acquired through training and practice.	Consider coding to this domain if discussing the ability to differentiate between an allergy and an adverse effect.	"they asked for more clarity about how to document allergies" "For example, participants believed they were unable to distinguish between an allergy and an adverse effect."

	Competence: One's repertoire of skills, and ability especially as it is applied to a task or set of tasks. **Ability:** Competence or capacity to perform a physical or mental act. Ability may be either unlearned or acquired by education and practice. **Interpersonal skills:** An aptitude enabling a person to carry on effective relationships with others, such as an ability to cooperate, to assume appropriate social responsibilities or to exhibit adequate flexibility. **Practice:** Repetition of an act, behaviour, or series of activities, often to improve performance or acquire a skill. **Skills assessment:** A judgement of the quality, worth, importance. Level or value of an ability or proficiency acquired through training and practice.		
3. Social/ professional role and identity	**Professional identity:** The characteristics by which an individual is recognised relating to, connected with or befitting a particular profession. **Professional role:** The behaviour considered appropriate for a particular kind of work or social position. **Social identity:** The set of behavioural or personal	Consider coding to this domain if talks about professional responsibilities or the different roles of healthcare professionals.	"participants across care settings expressed the opinion that these actions were outside the nurses' scope of practice" "It would be valuable to make specific working agreements with each other from now on"

	characteristics by which an individual is recognizable [and portrays] as a member of a social group. **Identity**: An individual's sense of self defined by a) a set of physical and psychological characteristics that is not wholly shared with any other person and b) a range of social and interpersonal affiliations (e.g., ethnicity) and social roles. **Professional boundaries:** The bounds or limits relating to, or connected with a particular profession or calling. **Professional confidence:** an individual's belief in his or her repertoire of skills and ability especially as it is applied to a task or set of tasks. **Group identity:** the set of behavioural or personal characteristics by which an individual is recognizable [and portrays] as a member of a group. **Leadership:** The processes involved in leading others, including organising, directing, coordinating and motivating their efforts toward achievement of certain group or organization goals. **Organizational commitment:** An employee's dedication to an		"Reporting an allergy is a shared responsibility, both of the patient and the physician. Registration is a responsibility of the physician."

	organisation and wish to remain part of it. Organisational commitment is often described as having both an emotional or moral element and a more prudent element.		
4. Beliefs about capabilities	**Self-confidence:** Self-assurance or trust in one's own abilities, capabilities and judgement. **Perceived competence:** An individual's belief in his or her ability to learn and execute skills. **Self-efficacy:** An individual's capacity to act effectively to bring about desired results, as perceived by the individual. **Perceived behavioural control:** an individual's perception of the ease or difficulty of performing the behaviour of interest. **Beliefs:** The thing believed; the proposition or set of propositions held true. **Self-esteem**: The degree to which the qualities and characteristics contained in one's self concept are perceived to be positive. **Empowerment:** The promotion of the skills, knowledge and confidence necessary to take great control of one's life as in certain educational or social schemes; the delegation of increased decision-making powers	Consider coding here if discussing the capability to delabel.	"the enormous amount of work it would take to evaluate all these unclear and incomplete records" "for others finding time was not an issue and asking a few questions about allergy was not perceived to be onerous"

	to individuals or groups in a society or organization. **Professional confidence**: An individual's beliefs in his or her repertoire of skills, and ability, especially as it is applied to a task or set of tasks.		
5. Optimism	**Optimism:** The attitude that outcomes will be positive and that people's wishes or aims will be ultimately fulfilled. **Pessimism**: The attitude that things will go wrong and that people's wishes or aims are unlikely to be fulfilled. **Unrealistic optimism:** the inert tendency for humans to over-rate their own abilities and chances of positive outcomes compared to those of other people.		"difficult to implement" "For some, removing incorrect penicillin allergy labels and exposing patients to penicillin was not considered a problem"
6. Beliefs about consequences	**Beliefs:** The thing believed; the proposition or set of propositions held true. **Outcome expectancies:** Cognitive, emotional, behavioural, and affective outcomes that are assumed to be associated with future or intended behaviour. These assumed outcomes can either promote or inhibit future behaviours. **Characteristics of outcome expectancies:** Characteristics of the cognitive, emotional and behavioural	Consider coding to emotion if participants are talking more about emotions, but if they are talking about consequences (fear of allergic reaction) consider coding to beliefs about consequences.	"Generally, we do not take these antibiotic allergies so seriously because it is usually a side effect." "Family physicians and pharmacists explained that doubts and fear of a serious allergic reaction, or sometimes even reoccurrence of a serious side effect, were the main reasons to select an alternative antibiotic." "Better safe than sorry"

	outcomes that individuals believe are associated with future or intended behaviours and that are believed to either promote or inhibit these behaviours. These include whether they are sanctions/ rewards, proximal/ distal, valued/ not valued, probable/ improbable. Salient/ not salient, perceived risks or threats. **Anticipated regret:** A sense of the potential negative consequences of a decision that influences the choice made: for example an individual may decide not to make an investment because of the feelings associated with an imagined loss. **Consequents:** An outcome behaviour in a given situation.		
7. Reinforcement	**Rewards (proximal/distal, valued/ not valued, probable/improbable):** Return or recompense made to, or received by a person contingent on some performance. **Incentives:** An external stimulus, such as condition or object, that enhances or serves as a motive for behaviour. **Punishment:** The process in which the relationship between a response and some stimulus or circumstance results in the response becoming less probable; a painful, unwanted or undesired event or circumstance		

	imposed as a penalty on a wrongdoer. **Consequents:** An outcome of behaviour in a given situation. **Reinforcement:** A process in which the frequency of a response is increased by a dependent relationship or contingency with a stimulus. **Contingencies:** A conditional probabilistic relation between two events. Contingencies may be arranged via dependencies or they may emerge by accident. **Sanctions:** A punishment or other coercive measure, usually administered by a recognized authority, that is used to penalise and deter inappropriate or unauthorized actions.		
8. Intentions	**Stability of intentions:** ability of one's resolve to remain in spite of disturbing influences. **Stages of Change model**: A model that proposes that behaviour change is accomplished through five specific stages. **Transtheoretical model and stages of change:** a five-stage theory to explain changes in people's health behaviour. It suggests that change takes time, that different interventions are effective at different stages, and		

	that there are multiple outcomes occurring across the stages.		
9. Goals	**Goals (distal/proximal):** Desired state of affairs of a person or system, these may be closer (proximal) or further away (distal). **Goal priority:** Order of importance or urgency of end state toward which one is striving. **Goal/target setting**: A process that establishes specific time based behavioural targets that are measureable, achievable and realistic. **Goals (autonomous/ controlled):** The end state toward which one is striving: the purpose of an activity or endeavour. It can be identified by observing that a person ceases or changes their behaviour upon attaining this state; proficiency in a task to be achieved within a set period of time. **Action planning:** The action or process of forming a plan regarding a thing to be done or a deed. **Implementation intention**: The plan that one creates in advance of when, where an how one will enact a behaviour.		"Cleaning up the current registrations, because there is a lot of contamination in our medical files."
10. Memory, attention, and decision processes	**Memory:** The ability to retain information or a representation of a past experience, based on the mental		"some pharmacists explained that they occasionally documented an allergy on purpose to misuse the alarm system, in

	processes of learning or encoding retention across some interval of time, and retrieval or reactivation of the memory; specific information of a specific task. **Attention**: A state of awareness in which the senses are focused selectively on aspects of the environment and the central nervous system is in a state of readiness to respond to stimuli. **Attention control**: The extent to which a person can concentrate on relevant cues and ignore all irrelevant cues in a given situation. **Decision making:** The cognitive process of choosing between two or more alternatives, ranging from the relatively clear-cut to the complex. **Cognitive overload/tiredness:** The situation in which the demands placed on a person by mental work are greater than a person's mental abilities.		order to block certain drugs in a patient's file. They used this practice when a patient did not want a certain drug or brand, because of adverse effects or costs" "I must admit that I also misuse the system from time to time. The only way I can prevent my assistants from providing a certain drug is by registering an allergy for that drug"
11. Environmental context and resources	**Environmental stressors:** External factors in the environment that cause stress. **Resources/material resources:** Commodities and human resources used in enacting a behaviour. **Organizational culture/climate:** A distinctive pattern of thought and behaviour shared by members of the	Consider coding to this domain if discussing problems with documentation or communication systems in place, healthcare professionals dealing with patients lack of knowledge.	"lack of clarity of current documentation" EHR barriers: "I think one of the problems is that, at least in our information system, we cannot differentiate between side effects and allergies."

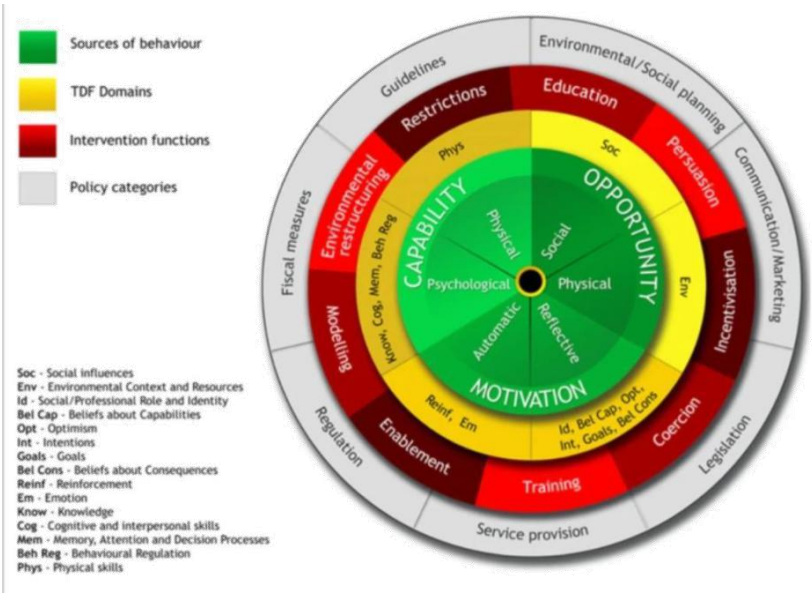
	same organization and reflected in their language, values, attitudes, beliefs and customs. **Salient events/critical incidents:** Occurrences that one judges to be distinctive, prominent or otherwise significant. **Person × environment interaction:** Interplay between the individual and their surroundings. **Barriers and facilitators:** In psychological contexts, barriers/facilitators are mental, emotional or behavioural limitations/strengths in individuals or groups.		"fewer options and nuances for documentation in EHRs." "Data insufficiently shared"
12. Social influences	**Social pressure:** the exertion of influence on a person or group by another person or group. **Social norms:** Socially determined consensual standards that indicate a) what behaviours are considered typical in a given context and b) what behaviours are considered proper in the context. **Group conformity**: The act of consciously maintaining a certain degree of similarity to those in your general social circles. **Social comparisons:** The process by which people evaluate their attitudes, abilities or performance relative to others.	Consider coding here if discussing how a patient's preferences/ beliefs drive the prescriber's behaviour.	"I often get a call from a pharmacist's assistant saying that a certain patient has an allergy for the prescribed antibiotic. And then I think, 'Oh, we didn't know anything about that'" "It was generally agreed that health care clinicians have a major influence on patients' perceptions as to whether they have an antibiotic allergy." "Influence of clinicians on patients"

	Group norms: Any behaviour, belief, attitude or emotional reaction held to be correct or acceptable by a given group in society. **Social support:** The apperception or provision of assistance or comfort to others, typically in order to help them cope with a variety of biological, psychological and social stressors. Support may arise from any interpersonal relationship in an individual's social network, involving friends, neighbours, religious institutions, colleagues, caregivers of support groups. **Power:** The capacity to influence others, even when they try to resist this influence. **Intergroup conflict:** Disagreement or confrontation between two or more groups and their members. This may involve physical violence, interpersonal discord, or psychological tension. **Alienation:** Estrangement from one's social group; a deep seated sense of dissatisfaction with one's personal experiences that can be a source of lack of trust in one's social or physical environment or in oneself; the experience of separation between thoughts and feelings.		

	Group identity: the set of behavioural or personal characteristics by which an individual is recognizable [and portrays] as a member of a group. **Modelling:** In developmental psychology the process in which one or more individuals or other entities serve as examples (models) that a child will copy.		
13. Emotion	**Fear:** An intense emotion aroused by the detection of imminent threat, involving an immediate alarm reaction that mobilizes the organism by triggering a set of physiological changes. **Anxiety:** A mood state characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe or misfortune. **Affect:** An experience or feeling of emotion, ranging from suffering to elation, from the simplest to the most complex sensations of feelings, and from the most normal to the most pathological emotional reactions. **Stress:** A state of physiological or psychological response to internal or external stressors. **Depression:** A mental state that presents with depressed mood, loss of	Consider coding to this domain if participants are talking more about emotions, but if they are talking about consequences (fear of allergic reaction) consider coding to beliefs about consequences.	"It (current antibiotic allergy registrations) is nothing but a mess…"

	interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration. **Positive/negative affect**: the internal feeling/state that occurs when a goal has/has not been attained. A source of threat has/has not been avoided, or the individual is/is not satisfied with the present state of affairs. **Burn-out:** Physical, emotional or mental exhaustion, especially in one's job or career, accompanied by decreased motivation, lowered performance and negative attitudes towards oneself and others.		
14. Behavioural regulations	**Self-monitoring:** A method used in behavioural management in which individuals keep a record of their behaviour, especially in connection with efforts to changes or regulate the self; a personality trait reflecting an ability to modify one's behaviour in response to a situation **Breaking habit:** to discontinue a behaviour or sequence of behaviours that is automatically activated by relevant situational cues. **Action planning**: The action or process of forming a plan regarding a thing to be done or a deed.		

Part 3. Behaviour change wheel (reproduced with permission of Susan Michie)[17,18,19]



Supplement to: Mann J, Cox V, Gorman S, Calissi P. Barriers to and facilitators of delabelling of antimicrobial allergies: a qualitative meta-synthesis. *Can J Hosp Pharm*. 2024;77(1):e3490. doi: 10.4212/cjhp.3490

Part 4. Data extraction results

General Information	
Title	Exploring the nurses' role in antibiotic stewardship: a multisite qualitative study of nurses and infection preventionists
Lead author contact details	Eileen J. Carter em2473@columbia.edu
Date of extraction	March 14 2021
Study Context	
Research Question / Aim	To explore the attitudes of nurses and infection preventionists (IPs) toward 5 nurse-driven antibiotic stewardship activities, including obtaining and recording an accurate penicillin drug allergy history. Investigators were interested in participants' attitudes regarding the belief that nurses should play a major role in antibiotic stewardship; challenges to nurses' ability to perform recommended practices; and ways to address identified challenges.
Country in which the study was conducted	USA: two academic hospitals providing care to adult or paediatric patients in New York City
Years of study	March to May 2017
Target Population	Clinical nurses, nurse managers, IPs working in general intensive care units (ICUs), and medical-surgical units
Study Design	
Theoretical approach	Not specified- but appears naturalistic.
Data Collection: • Method *(e.g. interview, focus group, observation)*	Focus groups and semi-structured interviews
• Tools used in data collection *(e.g., interview schedules, field notes, audio recordings)*	Interview guide piloted by clinical nurses prior to formal data collection. Field notes of contextual information and general impressions of discourse were taken. Discussions were recorded and transcribed.
• What has been counted as data? *(e.g., verbatim transcripts, fieldwork notes, researcher reflexive diaries)*	Verbatim transcripts, field notes
• Nature of researcher involvement *(e.g. number of researchers, who did what and when, hierarchy dynamics, insider or outsider researcher)*	EC: led interviews and focus groups, coded data; AS: took field notes during focus groups, coded data; AB coded data.

Sampling and recruitment strategy: • Was a sampling and/or recruitment strategy used? Justified?	Convenience sampling was used; email sent to nurses and IPs on target wards, flyers posted on target wards
• Inclusion and exclusion criteria?	Clinical nurses, nurse managers, and IPs on two target wards (ICU and medical-surgical units) in two centres.
Exclusion criteria	None stated
Justification for sample size/halting recruitment provided? (e.g. data saturation)	Study recruitment stopped when theoretical saturation was reached
Study Participants	
Frequency of data collection (e.g. number of focus groups, time frame for observations)	Nine focus groups and 4 interviews from March to May 2017. Duration of focus groups/interviews not stated.
Sample size (and attrition)	49 nurses, 5 nurse managers, 7 IPs; total sample size of 61
Relevant Participant characteristics (e.g. profession, patient group, demographics)	37 (61%) worked in adult setting; 24 (39%) worked in pediatric setting. All participants had bachelor's degree; 13 (21%) had master's degree. Years of work experience: 3 (5%) < 1 year, 15 (25%) 1-5 years; 14 (23%) 6-10 years, 29 (47%) > 10 years.
Method of recruitment of participants	email and flyer postings
Data Analysis	
Method (e.g. thematic analysis, data triangulation, member checking)	Conventional content analysis
Researcher involvement *(e.g. number of researchers involved, who did what and how?)*	Eight authors. See previous question. Unclear how 5 of the authors contributed.
Findings	
Summary of main findings according to author	Interpreting and recording a patient's self-reported penicillin allergy as either a true drug allergy or intolerance was felt to be outside the nurses' scope of practice. Nurses thought that performing an allergy assessment incorrectly may lead to patients receiving an antibiotic to which they had an allergy. Nurses thought that patients' descriptions of allergies should be recorded verbatim in medical record. To improve accurate assessments, nurses suggested they should inquire about signs and symptoms of reported allergies, document these in the medical record, and initiate conversations with prescribers when reported allergies are

	suspect. Nurses wanted to be provided with an educational algorithm to specify differences between allergic reactions and drug intolerances.
How are results presented?	Summarized findings in paragraph format. Selected quotes appeared in tabular format.
Author's conclusions	Nurses wished to become involved in antimicrobial stewardship activities including clarifying reported allergies, by using validated questions to verify and document allergy symptoms and by communicating questionable allergies to prescribers. Nurses thought that assessing whether the patient has a true allergy or not is outside nurses' scope of practice.
Possible conflicts of interest for study authors	No COI to report
References of note	none
Other notes	none

General Information	
Title	Focus group study exploring the issues and the solutions to incorrect penicillin allergy-labelled patients: an antibiotic stewardship patient safety initiative
Lead author contact details	Neil Powell Neil.powell2@nhs.net
Date of extraction	March 16 2021
Study Context	
Research Question / Aim	To explore barriers and enablers toward identifying and delabelling inpatients incorrectly labelled as penicillin allergic
Country in which the study was conducted	UK
Years of study	Years of study July 2017
Target Population	All healthcare professionals (hospital doctors, pharmacists, lead nurses and medical microbiologists)
Study Design	
Theoretical approach	Not specified but appears to be naturalistic approach.
Data Collection: • Method *(e.g. interview, focus group, observation)*	Focus groups × 2
• Tools used in data collection *(e.g., interview schedules, field notes, audio recordings)*	Semi structured topic guide, audio recorded

• What has been counted as data? *(e.g., verbatim transcripts, fieldwork notes, researcher reflexive diaries)*	Verbatim transcripts
• Nature of researcher involvement *(e.g. number of researchers, who did what and when, hierarchy dynamics, insider or outsider researcher)*	Three. GH: coded data and subthemes. NP: observed focus groups, independently assessed coding and subthemes. GH: professional focus group moderator, MW: observed focus groups
Sampling and recruitment strategy: • Was a sampling and/or recruitment strategy used? Justified?	All hospital staff were invited to participate via email. Strategy not justified. Sampling strategy not described; participants self-selected
• Inclusion and exclusion criteria?	All healthcare professionals in the single centre
Exclusion criteria	None stated
Justification for sample size/halting recruitment provided? (e.g. data saturation)	None stated
Study Participants	
Frequency of data collection (e.g. number of focus groups, time frame for observations)	Two focus groups; length of discussion not stated
Sample size (and attrition)	17 participants
Relevant Participant characteristics (e.g. profession, patient group, demographics)	Four consultants, four junior doctors, four nurses, four pharmacists, one medical microbiologist
Method of recruitment of participants	email
Data Analysis	
Method (e.g. thematic analysis, data triangulation, member checking)	Thematic analysis

Researcher involvement *(e.g. number of researchers involved, who did what and how?)*	Three researchers: GH - facilitated focus groups, coded data. NP - moderated and observed focus groups, assessed data coding, themes, and subthemes; MW - moderated and observed focus groups
Findings	
Summary of main findings according to author	Four main themes: inconsistencies in managing penicillin allergic patients; environmental barriers (time constraints, capability of EHR to document details of allergy); patient and staff education about risks of using second line antimicrobials & communicating delabelling widely (GP, care home, pharmacy records); future delabelling process using RN/doctors and their role in the process
How are results presented?	Paragraph form, supported by quotes from participants
Author's conclusions	Delabelling is a complex problem; penicillin allergy labels are regarded as 'risk free', greater understanding of consequences of incorrect allergy labels is needed.
Possible conflicts of interest for study authors	GH's time was reimbursed by a Pfizer study grant and Royal Cornwall Hospital Trust charitable funds. STC received funding from the National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Healthcare Associated Infections and Antimicrobial Resistance at the University of Oxford in partnership with Public Health England.
References of note	none
Other notes	Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol2006; 3: 77´101.

General Information	
Title	Inappropriate Antibiotic Allergy Documentation in Health Records: A Qualitative Study on Family Physicians' and Pharmacists' Experiences
Lead author contact details	Eefje G.P.M. de Bont. eefje.debont@maastrichtuniveristy.nl
Date of extraction	24 Feb 2021
Study Context	
Research Question / Aim	This study aimed to explore the experiences of family physicians and pharmacists performing and encountering antibiotic allergy documentations.
Country in which the study was conducted	South Limburg, the Netherlands
Years of study	mid-February to mid-May 2019
Target Population	Family physicians and pharmacists
Study Design	
Theoretical approach	Naturalistic approach
Data Collection:	Focus group

• Method *(e.g. interview, focus group, observation)*	
• Tools used in data collection *(e.g., interview schedules, field notes, audio recordings)*	Prepared questions and topic lists, audio-recordings of discussions, notes on nonverbal communication taken at focus group discussions, logbook
• What has been counted as data? *(e.g., verbatim transcripts, fieldwork notes, researcher reflexive diaries)*	Verbatim transcripts, notes on nonverbal communication, logbook notes
• Nature of researcher involvement *(e.g. number of researchers, who did what and when, hierarchy dynamics, insider or outsider researcher)*	Three researchers: KDC = focus group observer, transcribed discussions, coded transcripts; EGPMdB coded transcripts; JWLC resolved discrepancies in coding
Sampling and recruitment strategy: • Was a sampling and/or recruitment strategy used? Justified?	Purposeful sampling was used. Sampling was justified: researchers wanted to obtain information from physicians and pharmacists who use a variety of information systems, from varying cooperatives/regions, and with diverse backgrounds (academic, age, experience).
• Inclusion and exclusion criteria?	Co-operatives of family physicians and pharmacists in South Limburg
Exclusion criteria	None stated
Justification for sample size/halting recruitment provided? (e.g. data saturation)	Yes - the number of focus groups was determined by data saturation
Study Participants	
Frequency of data collection (e.g. number of focus groups, time frame for observations)	Four focus groups of 45 to 60 minutes duration
Sample size (and attrition)	44 participants
Relevant Participant characteristics (e.g. profession, patient group, demographics)	34 family physicians and 10 pharmacists. 26 males, mean age 44 years (range 27 to 67 years). Mean length of working experience: 14.5 years (range 0.5 to 33 years)

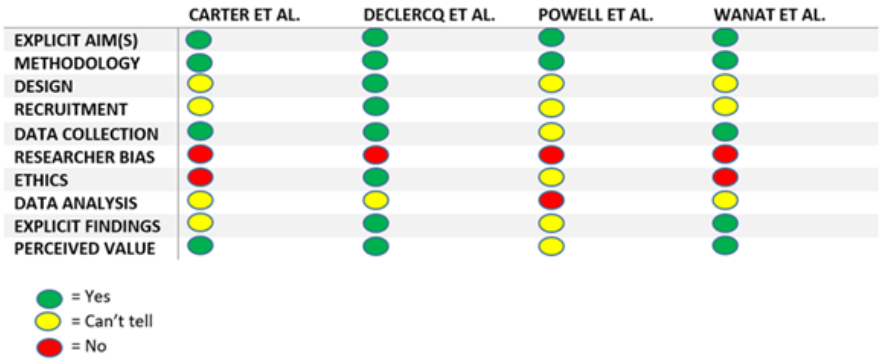
Method of recruitment of participants	e-mail; participants not reimbursed for their time
Data Analysis	
Method (e.g. thematic analysis, data triangulation, member checking)	Transcript analysis performed in duplicate using constant comparative technique, then used inductive content analysis with open and axial coding schemes to determine main categories and subcategories. Used NVivo software version 12 to code and analyze data.
Researcher involvement *(e.g. number of researchers involved, who did what and how?)*	Three researchers: KDC was primary investigator, focus group observer, transcribed discussions, coded transcripts, wrote first version of manuscript; EGPMdB conceived idea for study and coded transcripts, edited manuscript; JWLC conceived idea for study, resolved discrepancies in coding, edited manuscript
Findings	
Summary of main findings according to author	1. Magnitude and awareness of problem: lack of clarity of current documentation, amount of work to clarify incomplete records, inconsistency in knowledge of potential negative consequences of incorrect allergy documentation; skepticism about accuracy of records 2. Origin of inappropriate documentation: five contributing factors: historical (changes in documentation over time), EHR barriers (inability to discriminate allergy from AE), communication regarding documented allergies (between pharmacists, physicians, and patients), responsibility of documentation, knowledge about antibiotic allergies (how to distinguish allergy from AE). 3. Approaches for improving documentation: improved communication between clinicians, improve electronic documentation - separate allergies and ADRs, include detailed description of allergy, create separate system to document when patients do not want to receive drug (instead of labeling as allergic), clarify 'contaminated' allergy records.
How are results presented?	Paragraph format, with quotes to support themes. Also presented in graphical format (Figure 1) with quotes
Author's conclusions	Family physicians and pharmacists perceive that few documented antibiotic allergies are accurate. Barriers include limitations of the EHR, communication barriers, lack of knowledge and lack of facilitating tools. Improvement may be facilitated by practical working relationships between clinicians, proper communication between EHR systems, clarifying old documentation, improving knowledge through training module, and developing tools to relabel inappropriate documentation.
Possible conflicts of interest for study authors	No funding support for this study
References of note	None
Other notes	None

General Information	
Title	Patient and Primary Care Physician Perceptions of Penicillin Allergy Testing and Subsequent Use of Penicillin-Containing Antibiotics: A Qualitative Study
Lead author contact details	Marta Wanat; marta.wanat@phc.ox.ac.uk
Date of extraction	March 16 2021
Study Context	
Research Question / Aim	To identify clinician and patient views and experiences of referring to or attending for penicillin allergy testing, and the use of penicillins following negative allergy testing
Country in which the study was conducted	UK
Years of study	December 2017 to August 2018 (interviews)
Target Population	Patients with penicillin allergy record and clinicians in UK primary care
Study Design	
Theoretical approach	Not specified.
Data Collection: • Method *(e.g. interview, focus group, observation)*	Semi-structured interviews, 20 to 60 minutes each
• Tools used in data collection *(e.g., interview schedules, field notes, audio recordings)*	Two semi-structured interview guides, audio recorded interviews
• What has been counted as data? *(e.g., verbatim transcripts, fieldwork notes, researcher reflexive diaries)*	Verbatim transcripts
• Nature of researcher involvement *(e.g. number of researchers, who did what and when, hierarchy dynamics, insider or outsider researcher)*	Eight researchers (? authors) MW: read/re-read transcripts during and after data collection, initial coding of transcripts, developed coding framework; "experienced qualitative researcher" conducted interviews over the telephone, "wider multidisciplinary team" read and analyzed transcripts, agreed on preliminary codes, agreed on draft coding framework, discussed analysis of data.
Sampling and recruitment strategy: • Was a sampling and/or recruitment strategy used? Justified?	Purposeful sampling was used for target groups; then convenience sampling within those groups

• Inclusion and exclusion criteria?	Patients with experience of penicillin allergy testing from a general adult hospital allergy clinic between April 2015 and April 2017; and patients from general practices in the geographical area the allergy clinic served who had a record of penicillin allergy but did not undergo allergy testing. Primary care clinicians working in practices with patients who had undergone penicillin allergy testing in the hospital allergy clinic; clinicians working in general practices in geographical area served by the hospital; and clinicians who contacted the local microbiology services with queries during the study period.
Exclusion criteria	None stated
Justification for sample size/halting recruitment provided? (e.g. data saturation)	Interviews continued until data saturation was achieved in each participant group.
Study Participants	
Frequency of data collection (e.g. number of focus groups, time frame for observations)	50 interviews conducted between December 2017 and August 2018; interviews were 20 to 60 minutes long
Sample size (and attrition)	50 participants; 31 patients and 19 primary care clinicians
Relevant Participant characteristics (e.g. profession, patient group, demographics)	Patients: mean age 56 years (range 19 - 72 years) 80% female, 16 (51%) had experienced penicillin allergy testing Clinicians: mean age 42 years (range 34 - 60 years), 84% female, 9 (47%) had referred patients for penicillin allergy testing
Method of recruitment of participants	Selective invitation to participate to certain groups by mail (see inclusion criteria)
Data Analysis	
Method (e.g. thematic analysis, data triangulation, member checking)	Inductive thematic analysis approach
Researcher involvement *(e.g. number of researchers involved, who did what and how?)*	Eight researchers. See previous question
Findings	
Summary of main findings according to author	Patient views: Personal relevance (experienced negative consequences of penicillin label) affected perceived benefit and motivation to get tested; Safety and perceived risk of test (severity of index reaction) affected perception of future allergic reaction during skin testing; invasiveness of test (skin testing less frightening than oral challenge); adequacy of monitoring during test (trained medical staff; felt safer at clinic/hospital than at home); important to provide information about testing prior to procedure; Confidence in test result: greater confidence if thorough testing procedure, or taken penicillin without reaction following test. Some

	clinicians doubted results and continued to prescribe alternate antibiotics. Most participants felt anxious about taking penicillin after a negative test result. Clinician views: Doubts about removing penicillin allergy label (acknowledged inaccuracy of records; reluctant to remove label - did not want to be responsible for patient having allergic reaction, lack of knowledge/comfort removing label); Limited knowledge (of allergy service, benefits/risks of testing, actual testing procedures, accuracy of results, selection of patients for referral) resulting in inconsistent referral of patients for testing. Process of updating medical records: easy to change EMR, system may not differentiate between allergy and ADR, role of updating medical record (by allergist, clinician) and communicating results to patients.
How are results presented?	Results were presented by participant groups (patients vs. clinicians); results grouped into sub-themes with explanations and supportive quotes.
Author's conclusions	Patients and clinicians need to be supported to use penicillin allergy services and be provided with the skills and information to prescribe and use penicillins appropriately after a negative test result.
Possible conflicts of interest for study authors	Stated; some had prior funding from NIHR
References of note	
Other notes	

Part 5. Quality Assessment Summary: CASP Tool Results



CASP	Carter et al.[35]	Powell et al.[37]	De Clerq et al.[36]	Wanat et al.[4]
1. Was there a clear statement of the aims of the research?	**Yes** *The goal of research was clearly stated: To explore the attitudes of nurses and infection preventionists (IPs) toward 5 of the nurse-driven antibiotic stewardship activities recommended by the ANA/CDC working group. They provided supporting rationale for why they thought it was important and its relevance to nursing practice in the introduction.*	**Yes** *The aims and its importance were clearly stated in the introduction.*	**Yes** *The goals of research and its relevance were clearly stated.*	**Yes** *The aims of the study were clear.*
2. Is a qualitative methodology appropriate?	**Yes** *This research seeked out nursing attitudes to antibiotic stewardship activities and to*	**Yes** *(No comments)*	**Yes** *The authors justified their approach: "This approach allowed us to examine how inappropriate*	**Yes** *Research seeks to identify views and experiences therefore a qualitative*

	find solutions to barriers to the implementation in nursing practice.		*documentation happens and is experienced in actual daily practice. Focus group discussions were chosen because they are an efficient way of collecting qualitative data from varied perspectives, and the group interaction provides more insight on the topic."*	*methodology is appropriate.*
3. Was the research design appropriate to address the aims of the research?	**Can't tell** *Researchers used a mix of focus groups and semi-structured interviews in order to accommodate participants varied work schedules. Did not discuss other possible methods. (i.e., surveys)*	**Can't tell** *No discussion regarding how they decided on the research method to use. Method (focus group) appears appropriate but was not defended.*	**Yes** *The authors provided justification for why they used a naturalistic approach. "We conducted a qualitative study among family physicians and pharmacists using focus group discussions based on a naturalistic approach. This approach allowed us to examine how inappropriate documentation happens and is experienced in actual daily practice."*	**Can't tell** *Semi structured interviews seem appropriate to answer the research question however investigators did not justify their selection of research method.*

4. Was the recruitment strategy appropriate to the aims of the research?	**Can't tell** *Researchers did not explain why they chose nurses from general internal medicine wards/medical-surgical units. Researchers used a convenience sample of participants; they did not discuss why some people chose not to take part. They did not discuss if more people volunteered for the study than they required.*	**Can't tell** *No reason provided for the authors' selection of the healthcare professionals invited to participate in the study (hospital doctors, pharmacists, lead nurses, medical microbiologists). Participants were solicited by email. Did not state how many participants volunteered or how they arrived at their final sample size and range of specialties/professions (i.e., if sample was convenience or purposive). Used snowball sampling for nurses (lead nurses were invited to nominate a staff nurse to attend the focus group) and perhaps for medical microbiologist (medical microbiologist from neighboring hospital with a specialist allergy service was invited). Authors state that participants were self-selecting and there was a "low response rate" to the invitation to participate. Authors speculated the low response rate was likely due to workload*	**Yes** *Researcher used purposeful sampling by email to select participants from a variety of settings, backgrounds and computer software use. There were no discussions regarding why some people chose not to take part.*	**Can't tell** *Investigators used a selective sampling process to identify two patient groups to invite to participate: patients attending an allergy clinic in a two-year period (unclear if all patients attending clinic were invited or a selected sample of patients); and patients who did not undergo testing were identified from general practices (unclear how many practices) in the area that the allergy clinic served (50 to 100 patients identified per practice; number of practices unknown). Actual participants were volunteers from these groups. It was unclear how many patients responded and how the final 50 participants were selected (how many patients were excluded from being interviewed and why?) Similarly, investigators selected three clinician groups to invite to participate (working in a practice with patients who had undergone penicillin*

		of health care professionals and general availability. Not clear if some participants agreed then later chose not to take part.		*allergy testing, working in a practice in geographical area served by the hospital, clinicians who contacted the local microbiology services). It is unclear how many clinicians were invited to participate, how many volunteered, and how many (and why) some were excluded.*
5. Was the data collected in a way that addressed the research issue?	**Yes** *Setting for data collection was in person in a private room that was convenient and accessible to participants. Interview guide was piloted by clinical nurses prior to formal data collection. No mention if methods were modified during the study/if interview guide was modified during the study. Discussions were recorded; investigator took field notes of contextual information and general impressions of discourse. Investigators ceased study*	**Can't tell** *The setting for data collection was not justified (in the hospital). Data were collected through two focus groups. The researcher did not justify the methodology selected for use in the study. Focus groups used a semi-structured topic guide that was informed by previous work; focus groups were facilitated by a professional focus group moderator and observed by the principal investigators. It is unclear if the methods were modified during the study (not stated). Data collection was by audio recording during focus groups and transcribed verbatim (there was*	**Yes** *Focus groups were used, they justified this as an efficient way of collecting qualitative data from varied perspectives, and group interaction provides more insight on the topic. The interview method was well described. Both audio recordings and observer notes were used. Data extraction was discussed: "We adjusted the topic list several times throughout the study, to ensure data saturation was achieved."*	**Yes** *No justification of setting; data was collected by semi-structured interview; researcher did not justify the research method chosen; researchers used two semi-structured interview guides. Researchers did explain that interview guides were modified as necessary when interviewees discussed additional relevant topics; interview guides were included in the study appendix. Data from the interviews were audio recorded and transcribed verbatim. Interviews continued until data indicated saturation in each participant group.*

	recruitment when theoretical saturation reached.	*no mention of taking field notes/observations during the focus groups). The researchers did not discuss data saturation.*		
6. Has the relationship between researcher and participants been adequately considered?	**No** *No mention of the relationship between researchers and participants and how it may have affected results*	**No** *The researchers did not critically examine their own role, potential bias and influence during the formulation fo the research question (or the semi-structured topic guide). The researchers did not address how their role may have affected sample recruitment or choice of location. The participants were known to the two principal investigators. The participants were not known to the focus group moderator. There was no discussion as to how this may have affected the results of the study (biases). There was no mention of events occurring during the study, or changes in research design. As local microbiologists were unable to attend, a microbiologist from a neighboring hospital was invited to participate. Lead nurses were asked to*	**No** *There is no mention of the potential bias of the researchers, or their response to events during the study.*	**No** *There is no mention of the role of the researchers and their potential biases/influences. Researchers did modify the interview guides as necessary, but did not discuss how this affected the results of the research.*

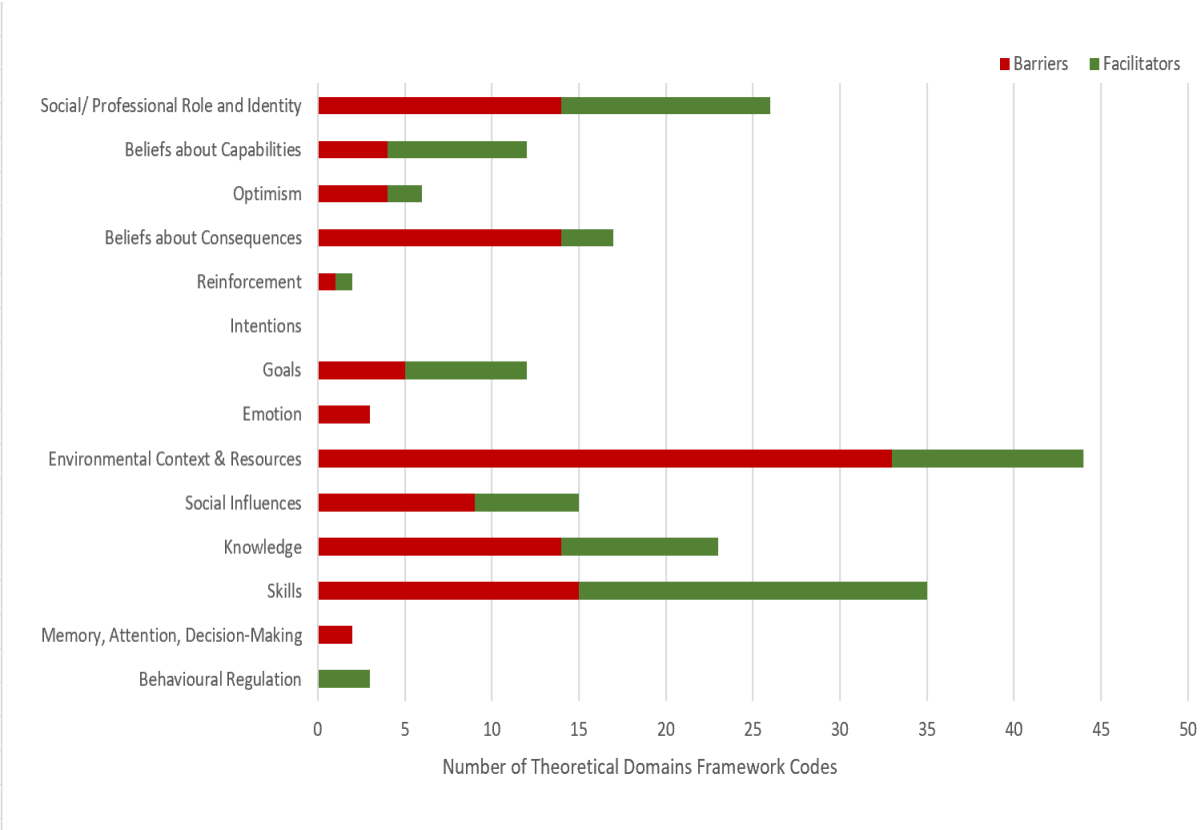
		nominate a staff nurse to attend the focus group. As such, the relationships between the researchers and participants may have biased the results (data from willing volunteers may differ from data from the general population).		
7. Have ethical issues been taken into consideration?	**No** *It was not stated if informed consent was obtained (verbal or written), or the details of consent. The local Institutional Review Board deemed consent not necessary.*	**Can't tell** *How the research was explained to participants to obtain verbal informed consent was not described in detail. No discussion was provided about how the researchers handled the effects of the study on the participants during and after the study. The investigators stated that ethical approval was not required as the study did not meet the health research authority definition for research (however the study was qualitative research and will be published - would think it would require expedited ethics approval).*	**Yes** *Participants received written information and provided written informed consent. Ethics approval was obtained. Data were encoded and anonymized. No mention of how data was stored, for how long, who had access to the data.*	**No** *They did not mention if they obtained ethics approval. Researchers noted they obtained consent; not clear how (verbal or written) and the details of how the research was explained to participants. Did not mention if they anonymized the data; quotes were anonymous.*
8. Was the data analysis sufficiently rigorous?	**Can't tell** *Conventional content analysis was used. Codes were derived from NVivo software (don't the*	**No** *Transcripts were anonymized (authors did not describe how this was done). Coding was done by one investigator, and*	**Can't tell** *Inductive content analysis using open then axial coding schemes. Coding scheme was modified*	**Can't tell** *Adequate description of analysis; used inductive thematic analysis; team agreed on preliminary codes;*

	researchers have to agree on the codes in Nvivo? i.e. unclear how categories were derived from the data). Researchers did not explain how the data presented were selected from the original sample. Data presented in paragraph form; only two quotes were documented in Table 3. Researchers did not describe contradictory data, or examine their own role/potential bias and influence during data analysis.	*the coding frame and subthemes were independently assessed by another investigator. There were no additional field notes or observations recorded during the focus groups, which may have improved the rigor of the data. The investigators do describe how they developed a thematic framework. Researcher does not explain how the data presented were selected from the original sample; sufficient data (and supporting quotes) appear to be presented to support the findings. The researchers did not examine their own role, potential bias, or influence during analysis and selection of data for presentation.*	*several times. Main categories discussed and determined by consensus. Unclear how quotes were selected from each category. Contradictory data is discussed in text/paragraphs. Used the COREQ criteria to report study findings. Limited discussion on researcher's role, potential bias, or influence during analysis - used an independent moderator to facilitate discussions/used open-ended questions "with the intention to reduce the influence of the researchers' opinions."*	*MW developed the coding framework which was amended as required as new data was gathered. Not a clear explanation of how the data presented were selected from the original sample. I think sufficient data were presented (in quotes) to support the findings. Authors did discuss contradictory results. Researcher did not critically examine their own role, potential bias and influence during analysis and selection of data for presentation.*
9. Is there a clear statement of findings?	**Can't tell** *There is no discussion of the evidence for and against the researcher's arguments. They did use triangulation (independent coding by two researchers of 25% of the*	**Can't tell** *The findings are grouped into sub themes, with text and quotes to support the sub themes. The researchers do provide contradictory evidence and results within the sub themes. The researchers did not discuss or appear to use triangulation*	**Yes** *Findings are presented in prose and in figures. Themes emerged from the data and are clearly stated. Researchers discuss the use of triangulation, analysis in duplicate. Respondent*	**Yes** *Researchers did discuss triangulation, did not appear to perform respondent validation, multidisciplinary team decided on preliminary codes and framework. Data analysis was conducted by a*

	sample). "All transcriptions were reviewed for accuracy" but it wasn't clear if the participants reviewed the transcripts for accuracy.	*methods, or respondent validation. They do describe two analysts of the data.*	*validation was performed. Findings seem explicit? No discussion of evidence for and against researcher's arguments.*	*multidisciplinary team. Findings appear to be explicit; views from the various groups (patients tested/not tested, three clinician groups) were reported. Findings were discussed in relation to the original research question.*
10. How valuable is the research?	**Yes** *The authors stated that this is the first study to engage a diverse group of stakeholders across the pediatric and adult settings to explore specific recommended nurse-driven antibiotic stewardship practices as recommended by the CDC, ANA, and several editorials. They did mention that this study was conducted at 2 academic teaching hospitals in New York City and findings may not be generalizable to other institutions. They did not identify new areas where research is necessary.*	**Can't tell** *Researchers acknowledge there is little research in this area. They loosely suggest that a "patient pathway" is likely to help identify and delabel patients (future research?). Researchers did not discuss whether the findings can be transferred to other populations or consider other ways the research can be used.*	**Yes** *The authors compared their results with the results from previous literature. "This is the first qualitative study focusing on family physicians' and pharmacists' experiences regarding inappropriate antibiotic allergy documentation and its causes. The primary strength of this study is that it provides an insight into the origin of this extensive problem."*	**Yes** *The authors commented that this study is the first to provide an in-depth understanding of patients' and primary care clinicians' views of the consequences of a penicillin allergy record and penicillin allergy testing. It highlighted key barriers and facilitators to delabelling after a negative test result. They acknowledged that this is an area not well defined in the literature, that previous studies often used survey designs and only focused on clinicians views so this study fills an important gap by providing a patient centered perspective. They recommended the next step could*

				include conducting a survey with a representative sample of patients, designed on the basis of results from this study.

Part 6. Barriers and facilitators to de-labeling antimicrobials as coded to the domains of the TDF



Supplement to: Mann J, Cox V, Gorman S, Calissi P. Barriers to and facilitators of delabelling of antimicrobial allergies: a qualitative meta-synthesis. *Can J Hosp Pharm*. 2024;77(1):e3490. doi: 10.4212/cjhp.3490

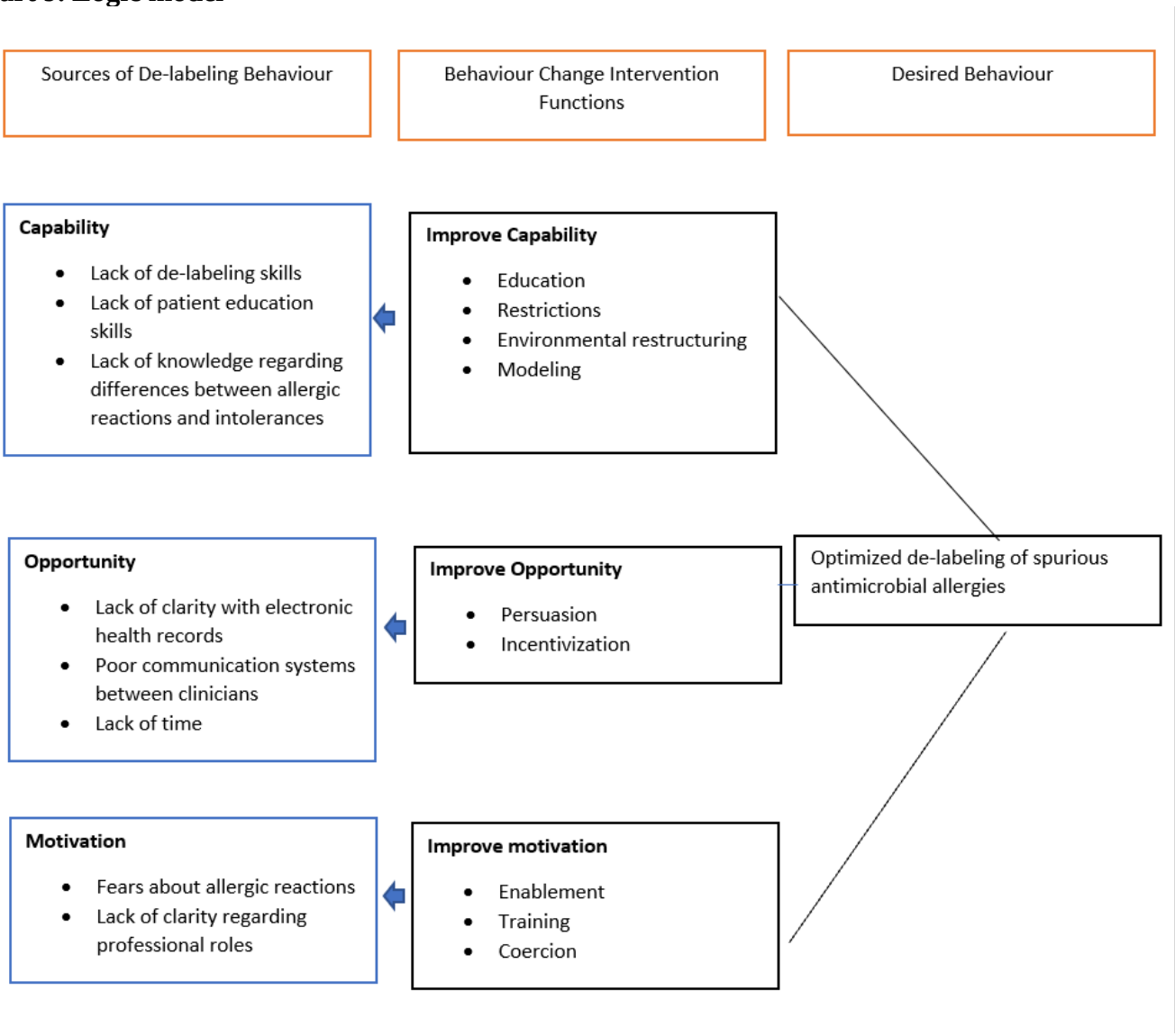
Part 7. Barriers to antimicrobial allergy delabelling

TDF	Quote
Environmental context & resources	"*What I encounter is that we don't share the data"*[36] *"Fewer options and nuances for documentation in EHRs"*[36] *"You don't have much time... balancing the amount of information to record with the time"*[37]
Skills	*"...it is difficult for them to distinguish an allergy from an adverse effect... there is need for a clear definition"*[36] *"For most their clinical judgment was not enough to change the medical records"*[4]
Social or professional role and identity	*"...participants across care settings expressed the opinion that these actions were outside the nurses' scope of practice"*[35]
Knowledge	"*Many participants were unaware of the potential negative when using second-choice antibiotics*"[36]
Beliefs about consequences	"*They were worried about being responsible for causing someone to have an allergic reaction"*[4]

Part 8. Facilitators of antimicrobial allergy delabelling

TDF Domain	Quote
Environmental context & resources	**"***Electronic communication among general practices, pharmacist, and hospitals should be improved to ensure optimal connection of their EHR systems"*[36]
Skills	***"****I would really like to have tools to know how I should register this"*[36] *"This highlights the need for a clear and consistent approach to delabelling"*[4]
Social or professional role and identity	**"***Participants did agree that responsibility should lie with either clinicians or pharmacists because they are able to evaluate the symptoms"*[36] "*…dedicated nurse specialist, as with the specialist sepsis or alcohol nurse, to give support and guidance to doctors, nurses and pharmacists with the proposed programme"*[37]
Knowledge	**"***Participants suggested that nurses be provided with an educational algorithm to specify the differences between true allergic reactions and drug intolerances"*[35]
Beliefs about consequences	**"***Some family physicians were aware that inappropriate documentation has consequences"*[36]

Part 9. Logic model



Supplement to: Mann J, Cox V, Gorman S, Calissi P. Barriers to and facilitators of delabelling of antimicrobial allergies: a qualitative meta-synthesis. *Can J Hosp Pharm*. 2024;77(1):e3490. doi: 10.4212/cjhp.3490

Part 10. GRADE CERQual evidence profile

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence in the evidence	Explanation of CERQual assessment
Delabelling skills Many physicians and pharmacists stated that they lack the ability to distinguish allergies from adverse drug reactions and concurrent viral illnesses.	4, 35-37	**Moderate methodological concerns**: one study 8/10 yes on CASP tool, one study 5/10, one study 4/10, one study 2/10. Concerns with the role of the researcher and their potential biases/ influences, mention of how ethics was obtained, description of why research design and recruitment strategy was appropriate.	**No concerns with coherence:** skill in distinguishing allergies from adverse drug reactions was both a barrier and a facilitator as interventions to overcome a lack of skills was seen as a facilitator to de-labeling.	**Minor concerns with adequacy**: only four articles were identified but data was contextually rich.	**No or very minor concerns with relevance:** multidisciplinary perspective (physicians, nurses, pharmacists) from three different countries (3 in Europe and 1 in USA)	Moderate	Moderate methodological concerns.
Patient education skills Some participants	4, 35-37	**Moderate methodological concerns**: one study 8/10 yes on	**No concerns with coherence:** skill in educating patients was both	**Minor concerns with adequacy:** only four articles were identified	**No or very minor concerns with relevance:** multidisciplinary	Moderate	Moderate methodological concerns

mentioned the importance of skill in educating patients about the risks of spurious allergy labels.		CASP tool, one study 5/10, one study 4/10, one study 2/10. Concerns with the role of the researcher and their potential biases/ influences, mention of how ethics was obtained, description of why research design and recruitment strategy was appropriate.	a barrier and a facilitator as interventions to overcome a lack of skills was seen as a facilitator to de-labeling.	but data was contextually rich.	perspective (physicians, nurses, pharmacists) from three different countries (3 in Europe and 1 in USA)		
Knowledge Many participants reported a lack of knowledge, specifically regarding the potential adverse consequences of spurious allergy labels and the use of second line antibiotics.	4, 35-37	**Moderate methodological concerns**: one study 8/10 yes on CASP tool, one study 5/10, one study 4/10, one study 2/10. Concerns with the role of the researcher and their potential biases/ influences, mention of how ethics was obtained,	**No concerns with coherence:** knowledge was both a barrier and a facilitator as interventions to overcome a lack of knowledge was seen as a facilitator to de-labeling.	**Minor concerns with adequacy:** only four articles were identified but data was contextually rich.	**No or very minor concerns with relevance:** multidisciplinary perspective (physicians, nurses, pharmacists) from three different countries (3 in Europe and 1 in USA)	Moderate	Moderate methodological concerns

		description of why research design and recruitment strategy was appropriate.					
Electronic health records Clinicians believed that the lack of clarity of current documentation is a barrier to de-labeling. There was often a lack of nuance with no differentiation between allergies and intolerances and misuse of alarm systems to flag patient preferences.	4, 35-37	**Moderate methodological concerns**: one study 8/10 yes on CASP tool, one study 5/10, one study 4/10, one study 2/10. Concerns with the role of the researcher and their potential biases/ influences, mention of how ethics was obtained, description of why research design and recruitment strategy was appropriate.	**No concerns with coherence:** electronic health records was both a barrier and a facilitator as improving documentation was seen as a facilitator to de-labeling.	**Moderate concerns with adequacy:** only four articles were identified but data was contextually rich. However, all sites were outside of Canada. EHRs may be significantly different from those in Canada.	**No or very minor concerns with relevance:** multidisciplinary perspective (physicians, nurses, pharmacists) from three different countries (3 in Europe and 1 in USA)	Low	Moderate methodological and adequacy concerns. Concerns with external validity (to health care in Canada).
Communication frameworks A lack of communication was noted between healthcare	4, 35-37	**Moderate methodological concerns**: one study 8/10 yes on CASP tool, one study 5/10, one study 4/10, one	**No concerns with coherence:** communication between health care providers was both a barrier and a facilitator	**Moderate concerns with adequacy**: only four articles were identified but data was contextually rich.	**No or very minor concerns with relevance:** multidisciplinary perspective (physicians, nurses,	Moderate	Moderate methodological and adequacy concerns. Concerns with external validity

providers, and one healthcare provider may de-label an allergy without communicating to other providers who also care for that patient.		study 2/10. Concerns with the role of the researcher and their potential biases/ influences, mention of how ethics was obtained, description of why research design and recruitment strategy was appropriate.	as interventions to overcome a lack of communication was seen as a facilitator to de-labeling.	However, all sites were outside of Canada. Communication networks may be significantly different from those in Canada.	pharmacists) from three different countries (3 in Europe and 1 in USA)		(to health care in Canada).
Time Any new de-labeling procedure that increases nursing or physician paperwork was looked at with caution by many nurses as they were already overwhelmed by paperwork.	37	**Serious methodological concerns** (1 study contributed to finding: lack of justification for research methods, recruitment strategy, setting for data collection, no discussion of data saturation, researchers did not critically examine their own role, potential bias and influence, did not discuss triangulation)	**No concerns with coherence:** time was both a barrier and a facilitator as interventions to overcome a lack of time was seen as a facilitator to de-labeling.	**Serious concerns with adequacy:** only one article contributed with superficial data.	**Serious concerns with relevance**: only one article contributed data. De-labeling antimicrobial allergies was not the primary objective of this study (was to explore attitudes of nurses and infection preventionists to 5 nurse driven antibiotic stewardship activities. Only included the views	Low	Serious methodological and relevance concerns.

					of nurses and infection preventionists.		
Fears about allergic reaction Some participants reported the fear of adverse events as being a barrier to de-labeling.	4, 35-37	**Moderate methodological concerns**: one study 8/10 yes on CASP tool, one study 5/10, one study 4/10, one study 2/10. Concerns with the role of the researcher and their potential biases/ influences, mention of how ethics was obtained, description of why research design and recruitment strategy was appropriate.	**Minor concerns with coherence:** fears of adverse reactions were both a barrier and a facilitator as interventions to overcome fears was seen as a facilitator to de-labeling.	**Minor concerns with adequacy:** only four articles were identified but data was contextually rich.	**No or very minor concerns with relevance:** multidisciplinary perspective (physicians, nurses, pharmacists) from three different countries (3 in Europe and 1 in USA)	Moderate	Moderate methodological concerns.
Professional roles Many nurses expressed the view that allergy assessment and/or de-labeling is outside -of their	4, 35-37	**Moderate methodological concerns**: one study 8/10 yes on CASP tool, one study 5/10, one study 4/10, one study 2/10. Concerns with the	**Minor concerns with coherence:** uncertainty regarding professional roles was both a barrier and a facilitator as interventions to overcome	**Minor concerns with adequacy**: only four articles were identified but data was contextually rich.	**No or very minor concerns with relevance:** multidisciplinary perspective (physicians, nurses, pharmacists) from three different	Moderate	Moderate methodological concerns.

scope of practice. There was also uncertainty regarding who should be responsible for de-labeling and educating patients.		role of the researcher and their potential biases/ influences, mention of how ethics was obtained, description of why research design and recruitment strategy was appropriate.	uncertainty was seen as a facilitator to de-labeling.		countries (3 in Europe and 1 in USA)		

OVERALL: moderate confidence in review findings (options are high, moderate, low, or very low).

1. De Clerq et al.[36] Inappropriate allergy documentation in health records: a qualitative study on family physicians and pharmacists' experiences. N=44
2. Carter et al.[35] Exploring the nurses' role in antibiotic stewardship: A multisite qualitative study of nurses and infection preventionists N=61
3. Wanat et al.[4] Patient and primary care physician perceptions of penicillin allergy testing and subsequent use of penicillin- containing antibiotics: a qualitative study N=100
4. Powell et al.[37] Focus group study exploring the issues and the solutions to incorrect penicillin allergy-labelled patients: an antibiotic stewardship patient safety initiative N=17 participants

5. **Part 11. CERQual summary of qualitative findings**

Objective
1. To describe barriers and facilitators to healthcare workers de-labeling spurious antimicrobial allergies from patient databases/ profiles in all healthcare settings using a validated framework and model of behaviour change (TDF).
2. To link these barriers to potential interventions/ and or policies and inform the design of future BCI.

Perspective
Healthcare professionals (physicians, nurse practitioners, registered nurses, licensed practical nurses, pharmacists) in all healthcare settings (hospital, long term care, community, etc.) in high income countries.

Summary of Review Finding	**Studies contributing to review finding**	**CERQual assessment of confidence in the evidence**	**Explanation of CERQual assessment**
Delabelling Skills Physicians and pharmacists stated that they lack the ability to distinguish allergies from adverse drug reactions and concurrent viral illnesses.	4, 35-37	Moderate	Moderate methodological concerns
Patient Education Skills Participants mentioned the importance of skill in educating patients about the risks of spurious allergy labels.	4, 35-37	Moderate	Moderate methodological concerns
Knowledge Participants reported a lack of knowledge, specifically regarding the potential adverse consequences of spurious allergy labels and the use of second line antibiotics.	4, 35-37	Moderate	Moderate methodological concerns
Electronic health records Participants believed that the lack of clarity of current documentation was a barrier to de-labeling. There was often no way to differentially document allergies and intolerances resulting in subsequent misuse of EHR alarm systems to flag patient antimicrobial preferences.	4, 35-37	Low	Moderate methodological and adequacy concerns. Concerns with external validity.
Communication frameworks A lack of communication was noted between healthcare providers; one healthcare provider may de-label an allergy without communicating to other providers who also care for that patient.	4, 35-37	Moderate	Moderate methodological and adequacy concerns. Concerns with external validity.

Time Any new de-labeling procedure that increased nursing or physician administrative tasks was regarded with caution by many nurses as they felt already overwhelmed by paperwork.	37	Low	Serious methodological and relevance concerns.
Fears about allergic reaction Some participants reported the fear of adverse events as being a barrier to de-labeling.	4, 35-37	Moderate	Moderate methodological concerns.
Professional roles Many nurses expressed the view that allergy assessment and/or de-labeling was outside of their scope of practice. There was also uncertainty regarding who should be responsible for de-labeling and educating patients.	4, 35-37	Moderate	Moderate methodological concerns.